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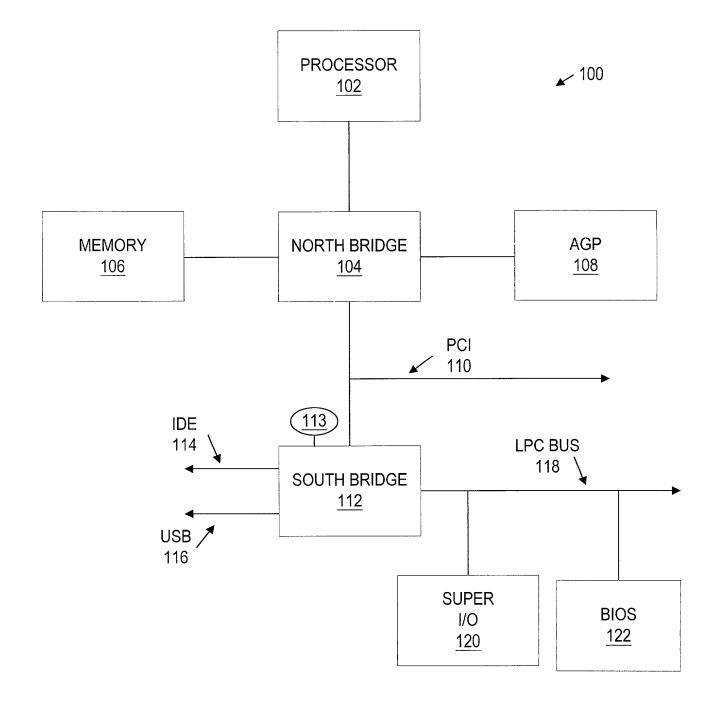


Fig. 1A (Prior Art)

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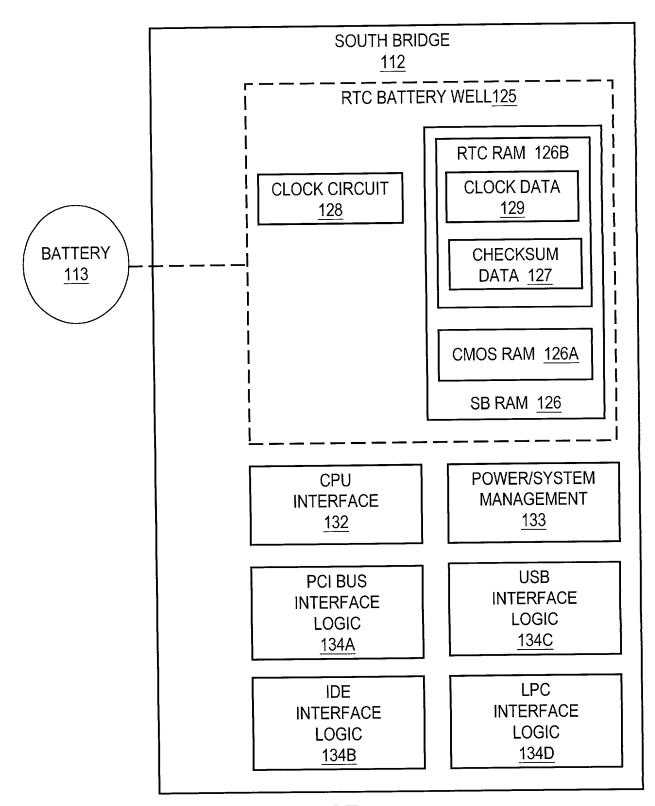


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**/** 170

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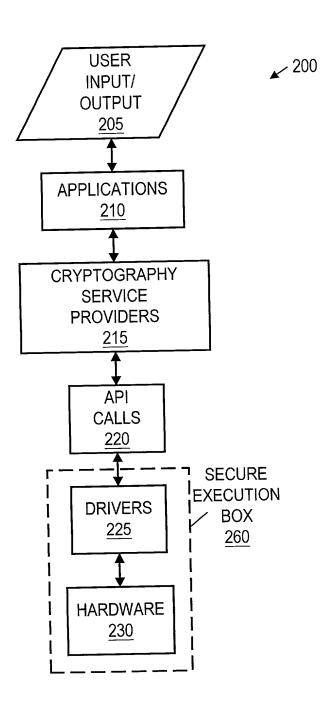
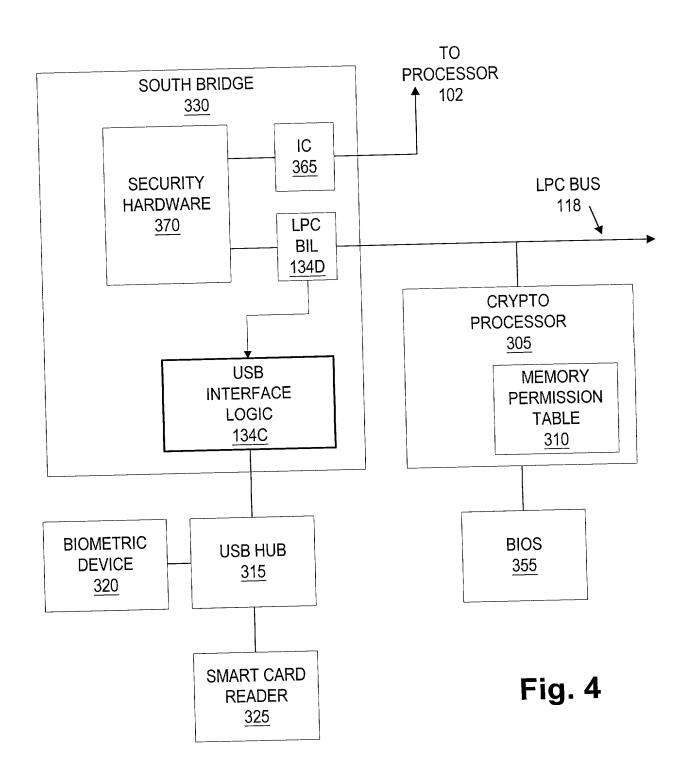


Fig. 3



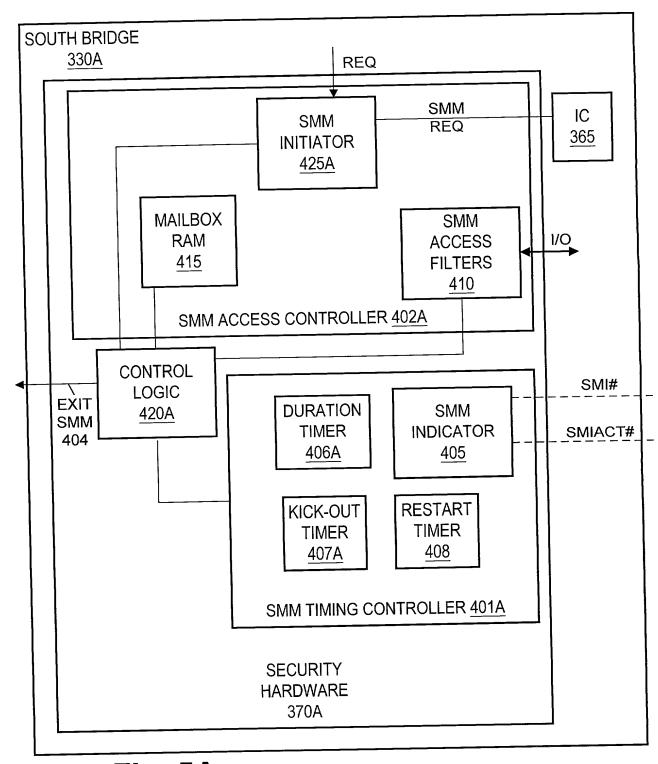
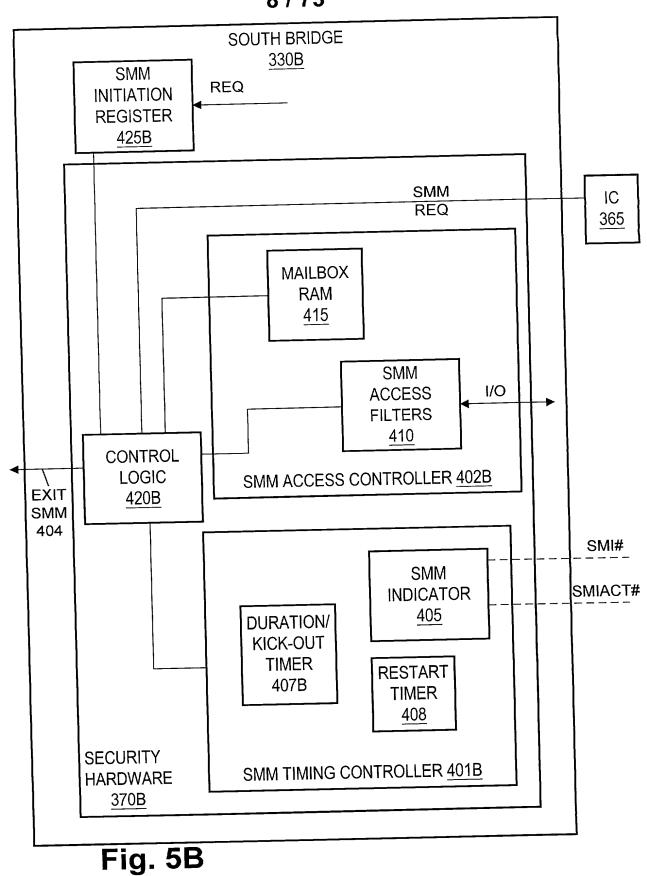


Fig. 5A

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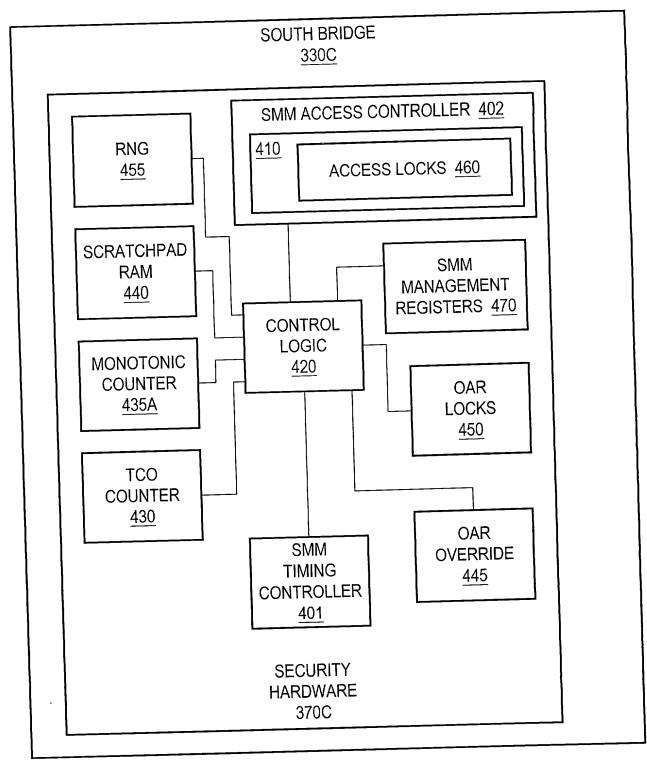
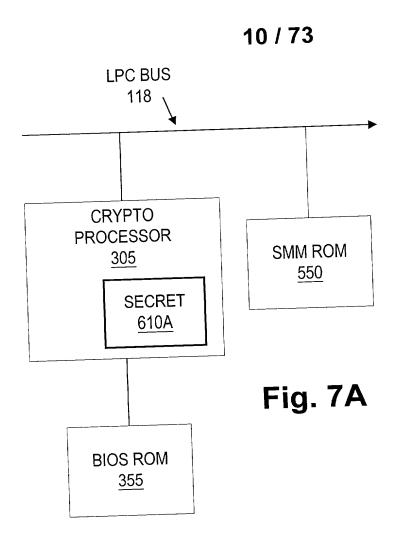


Fig. 6



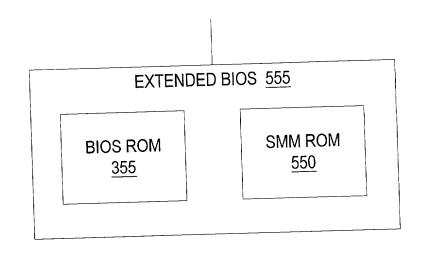


Fig. 7B

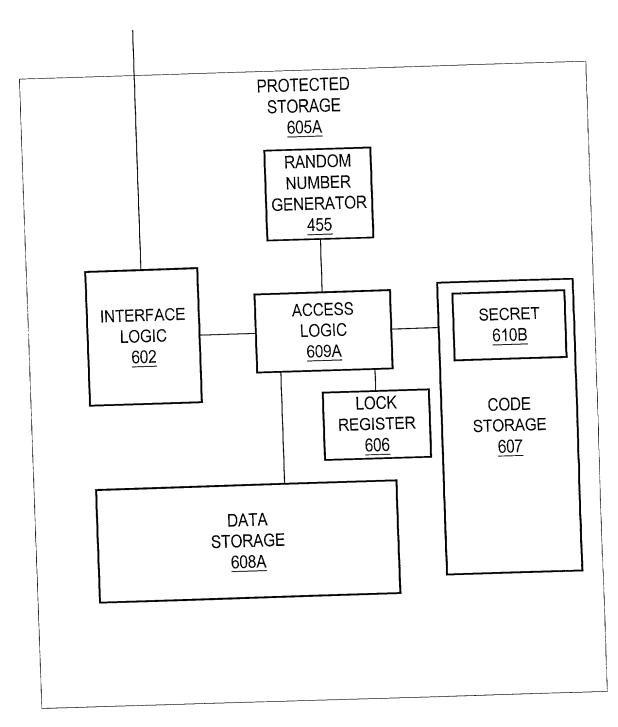


Fig. 7C

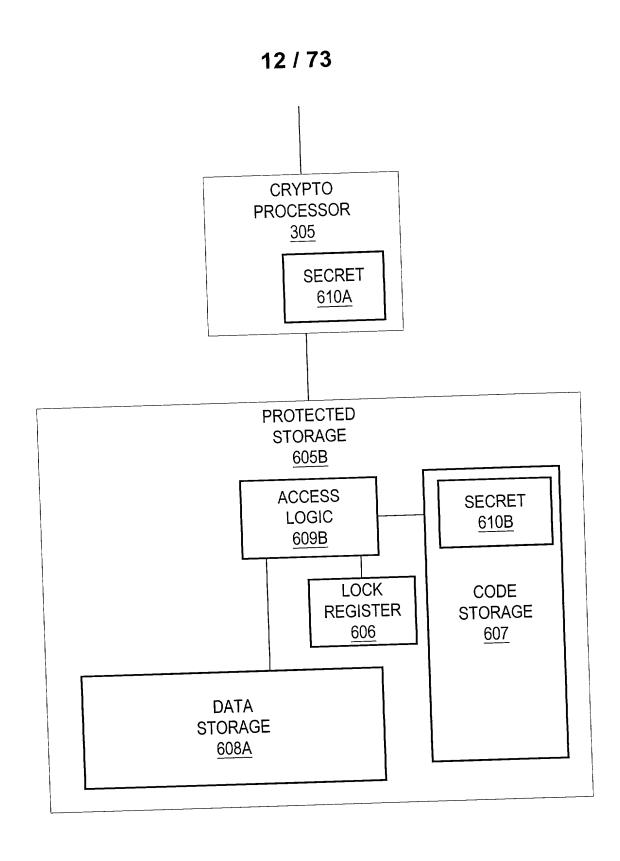


Fig. 7D

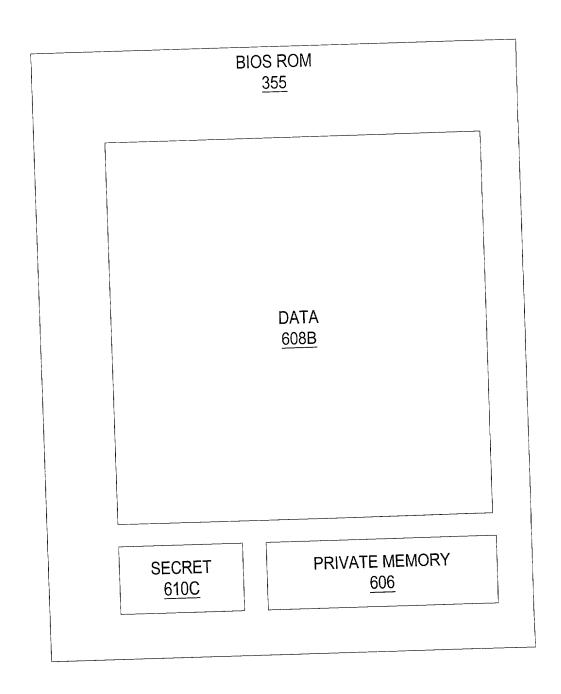


Fig. 8A

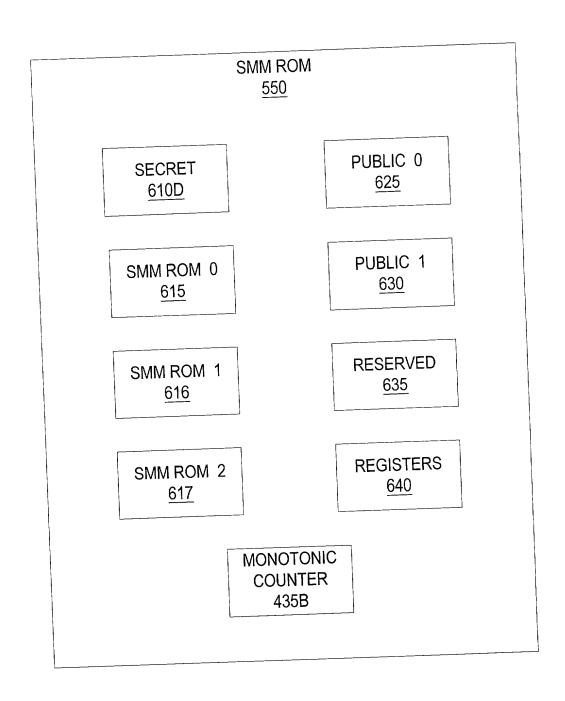


Fig. 8B

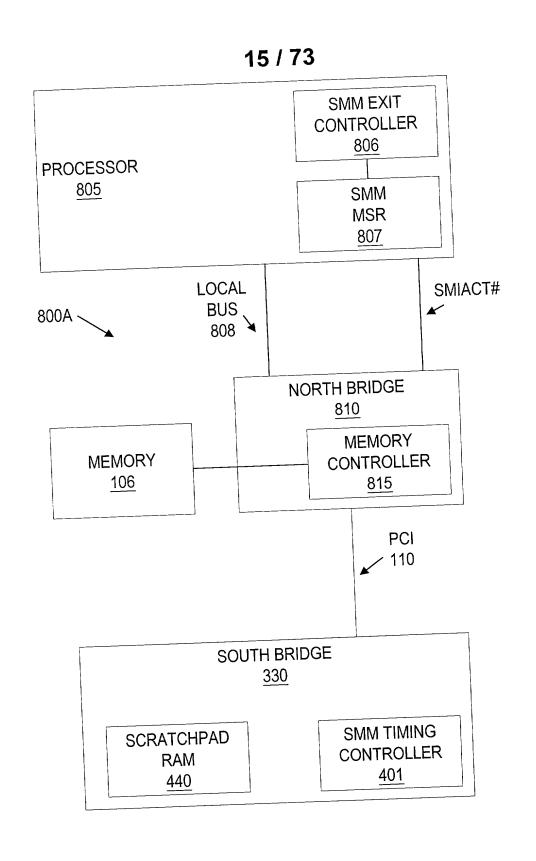


Fig. 9A

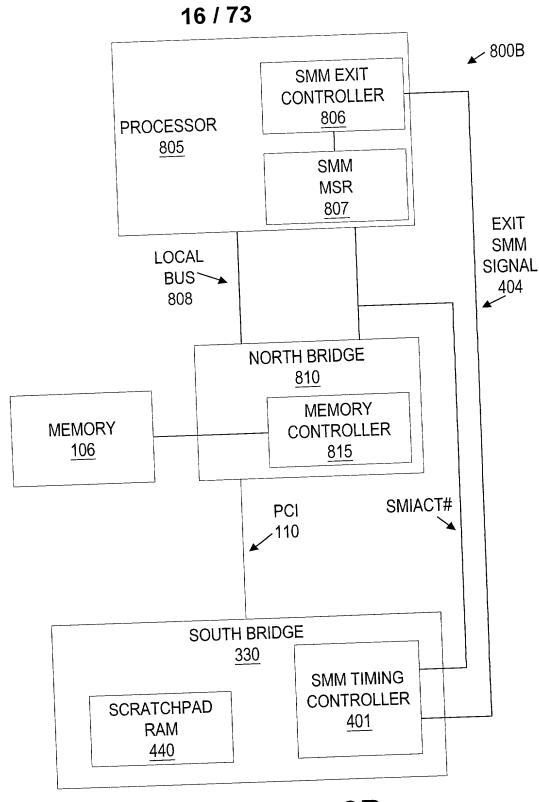


Fig. 9B

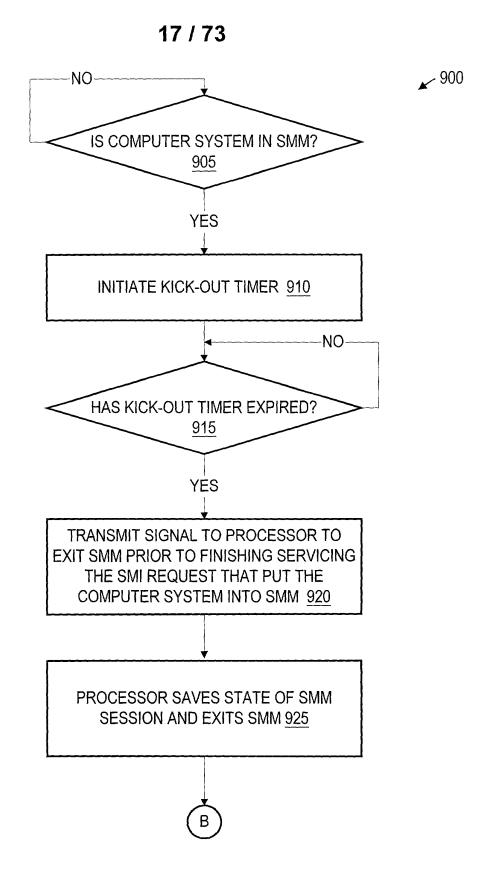
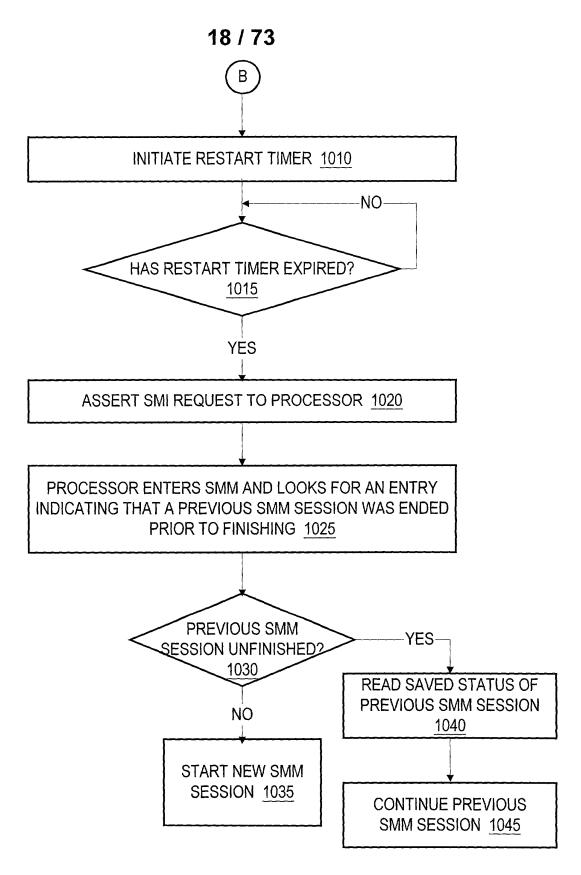
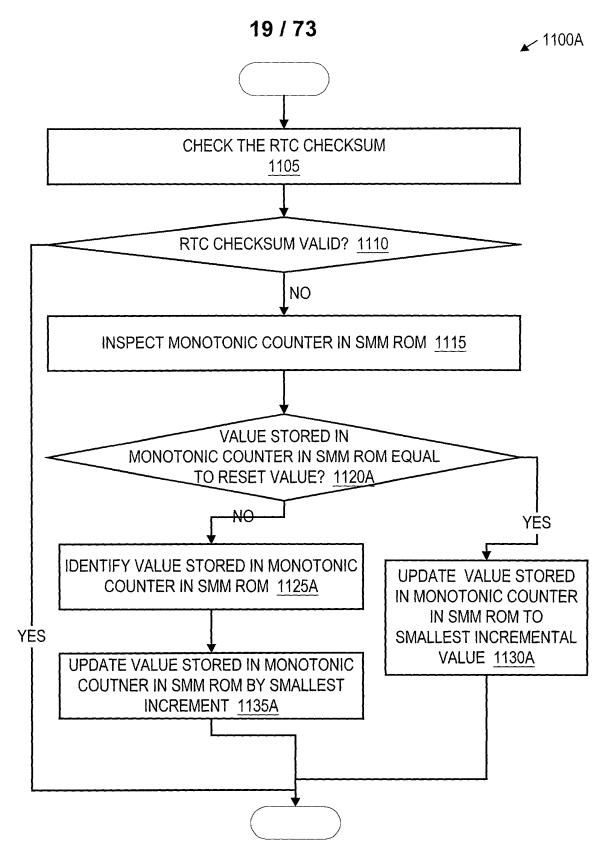


Fig. 10A



**Fig. 10B** 



**Fig. 11A** 

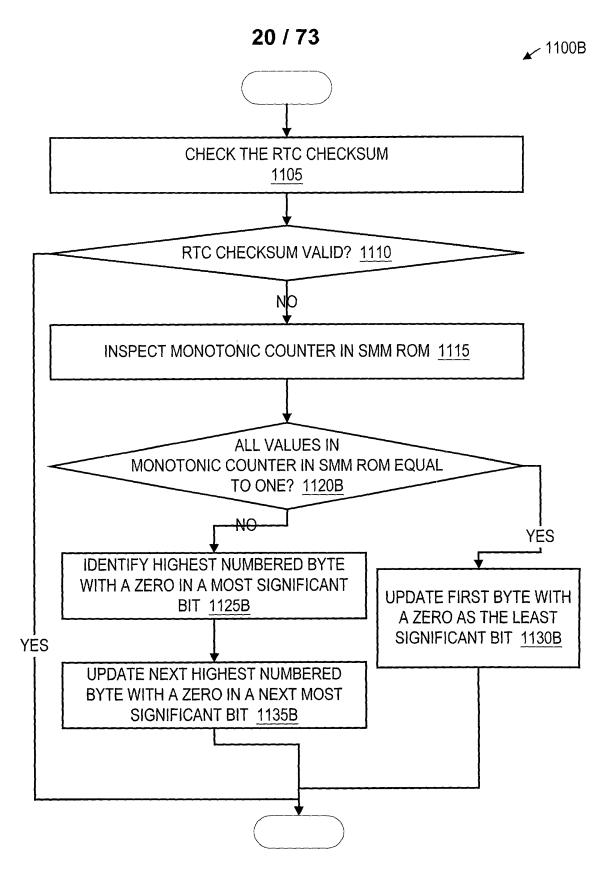
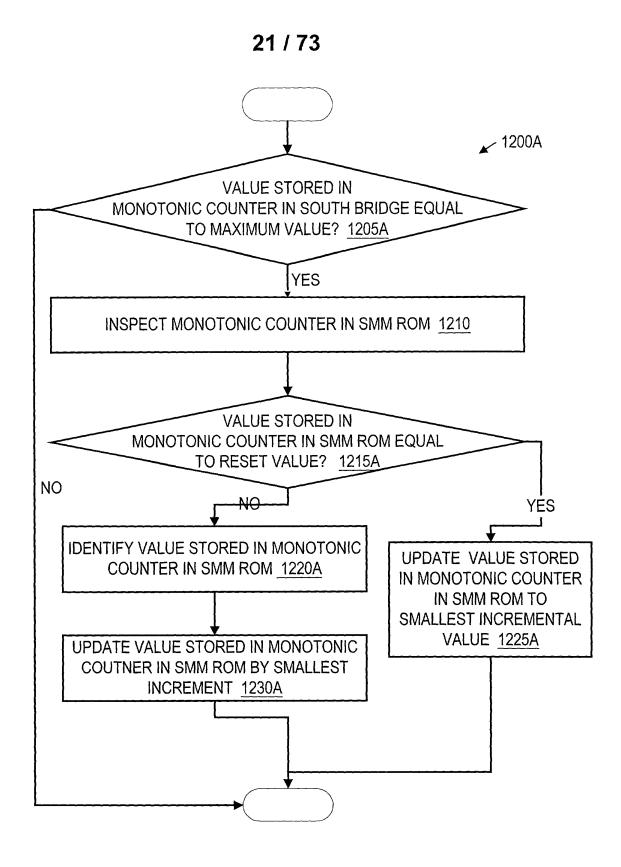


Fig. 11B



**Fig. 12A** 

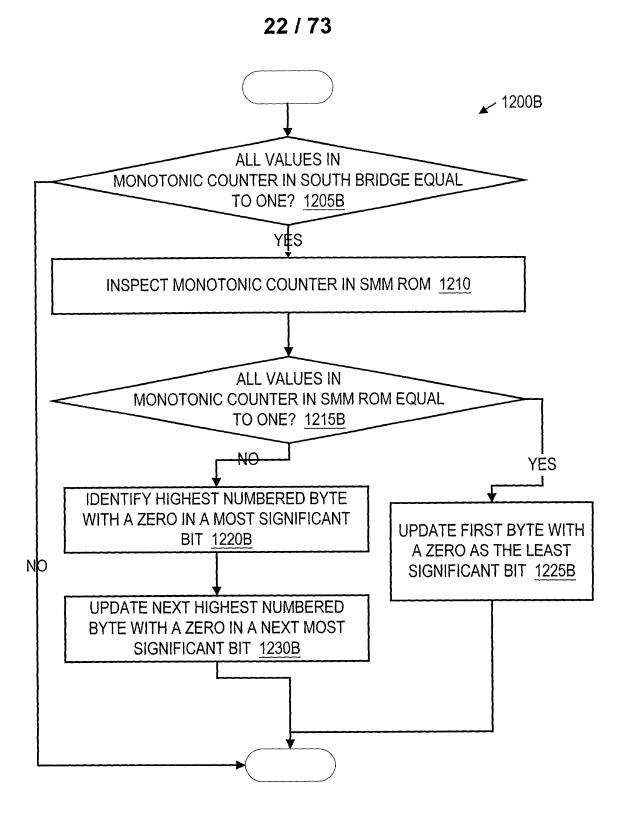
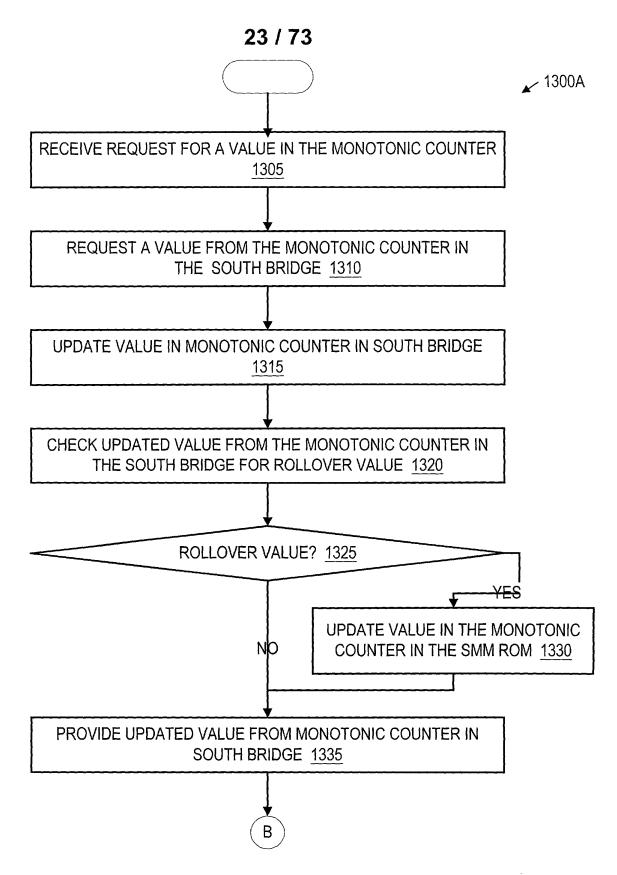


Fig. 12B



**Fig. 13A** 

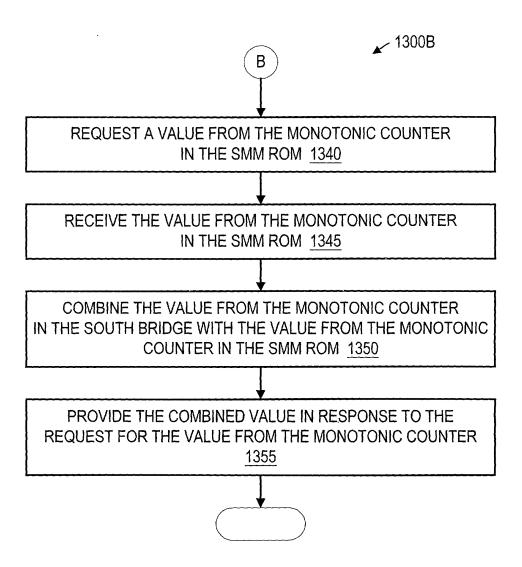


Fig. 13B

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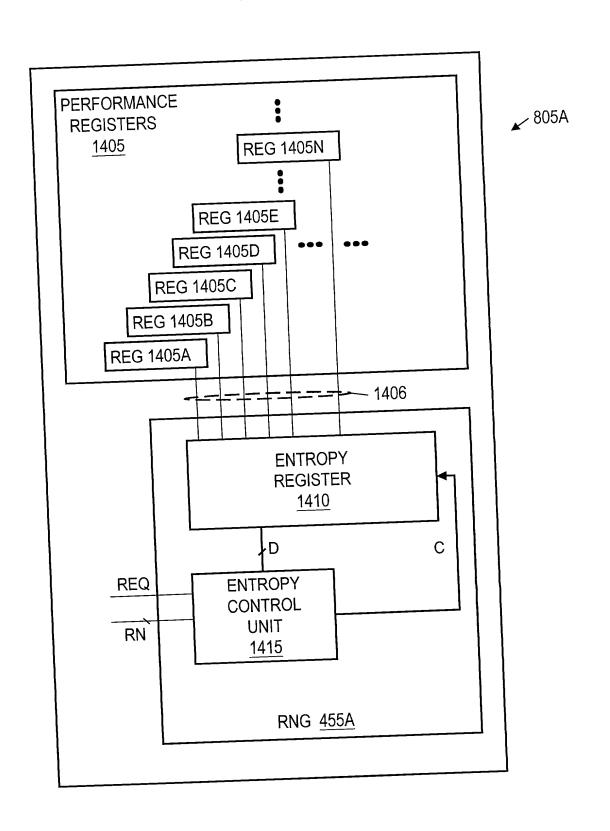
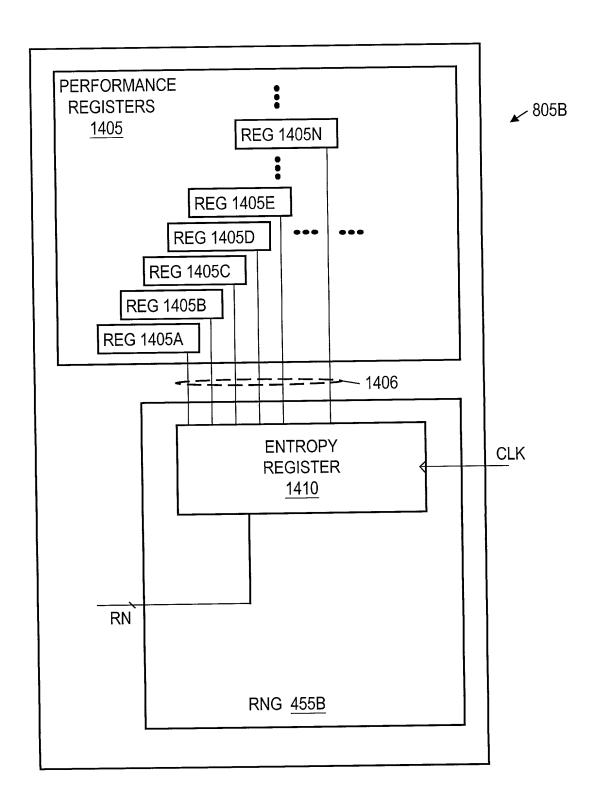


Fig. 14A

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**Fig. 14B** 

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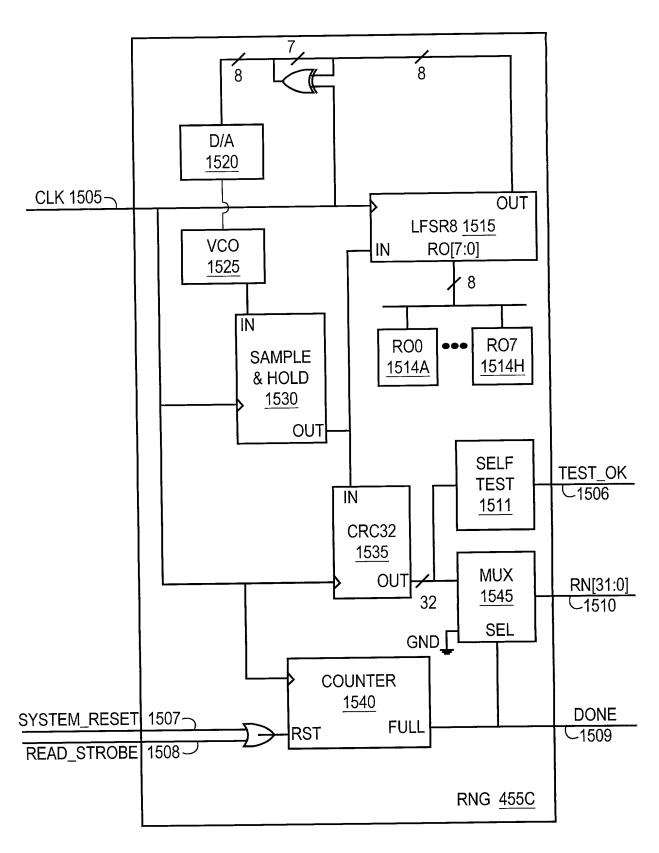


Fig. 15



\_\_\_ 1600A THE PROCESSOR EXECUTES BIOS CODE INSTRUCTIONS FROM SMM SPACE IN THE RAM 1620 BIOS CODE PERFORMS POWER ON SELF TEST (POST) 1625 ACCESSING THE SECURITY HARDWARE 1630 OPTIONALLY ENTER BIOS MANAGEMENT MODE 1632 BIOS CODE LOOKS FOR ADDITIONAL BIOS CODE, SUCH AS VIDEO @ C000h AND ATA/IDE HARD DRIVE BIOS CODE @ C800h, AND DISPLAYS A START-UP INFORMATION SCREEN 1635 BIOS CODE PERFORMS ADDITIONAL SYSTEM TESTS, SUCH AS THE RAM COUNT-UP TEST, AND SYSTEM INVENTORY, SUCH AS IDENTIFYING COM AND LPT PORTS 1640 BIOS CODE IDENTIFIES PLUG-N-PLAY AND OTHER SIMILAR DEVICES AND DISPLAYS A SUMMARY SCREEN 1645 CLOSING THE ACCESS LOCKS TO THE SECURITY HARDWARE 1650 BIOS CODE IDENTIFIES THE BOOT LOCATION 1655 BIOS CODE CALLS THE BOOT SECTOR CODE TO BOOT THE COMPUTER

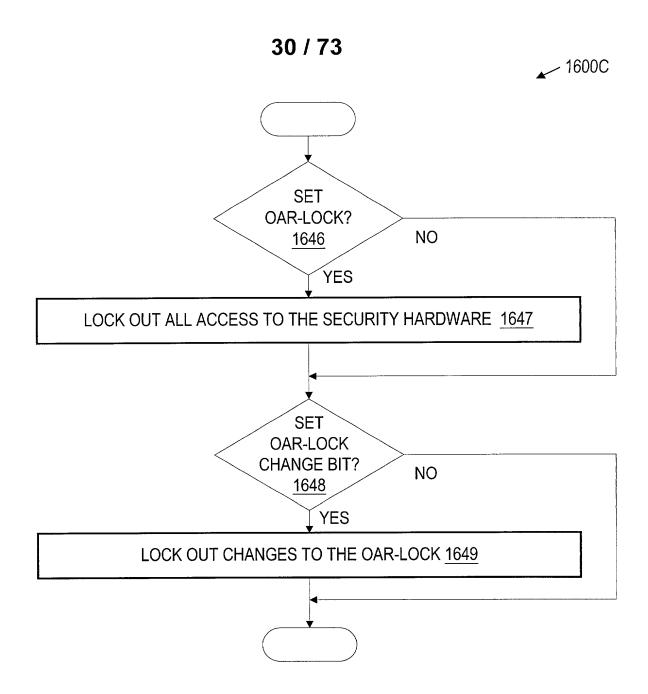
**Fig. 16A** 

SYSTEM 1660

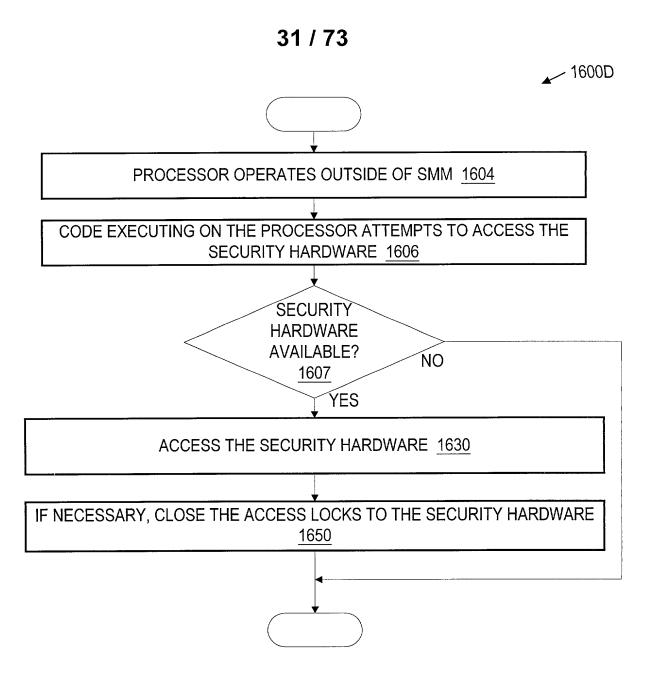
\_\_\_ 1600B

OPENING THE ACCESS LOCKS TO THE SECURITY HARDWARE 1615 THE PROCESSOR EXECUTES BIOS CODE INSTRUCTIONS FROM SMM SPACE IN THE RAM 1620 ACCESSING THE SECURITY HARDWARE 1630 OPTIONALLY ENTER BIOS MANAGEMENT MODE 1632 BIOS CODE LOOKS FOR ADDITIONAL BIOS CODE, SUCH AS VIDEO @ C000h AND ATA/IDE HARD DRIVE BIOS CODE @ C800h, AND DISPLAYS A START-UP INFORMATION SCREEN 1635 BIOS CODE IDENTIFIES PLUG-N-PLAY AND OTHER SIMILAR DEVICES AND DISPLAYS A SUMMARY SCREEN 1645 CLOSING THE ACCESS LOCKS TO THE SECURITY HARDWARE 1650 BIOS CODE IDENTIFIES THE BOOT LOCATION 1655 BIOS CODE CALLS THE BOOT SECTOR CODE TO BOOT THE COMPUTER SYSTEM 1660

Fig. 16B



**Fig. 16C** 



**Fig. 16D** 

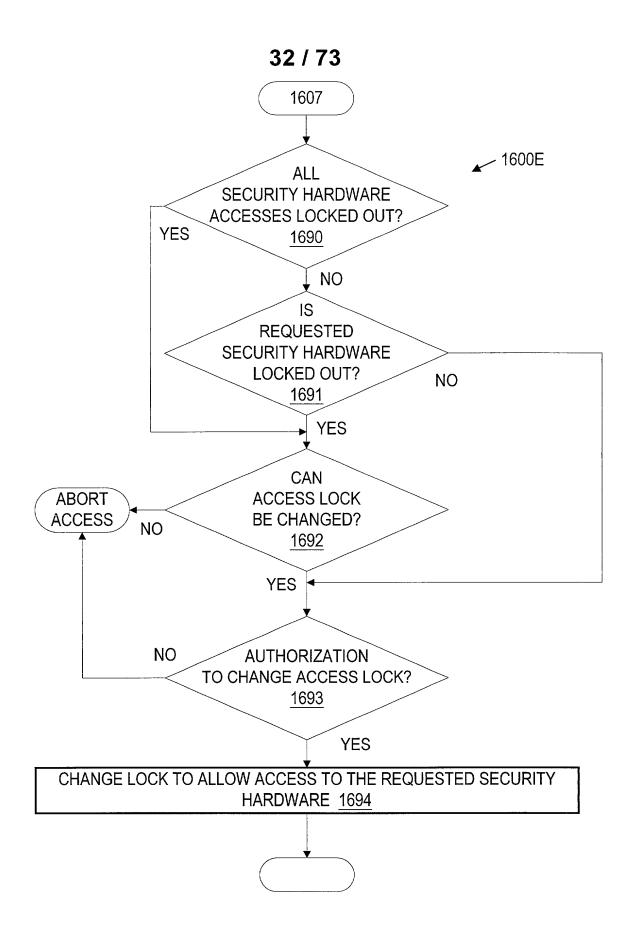


Fig. 16E

THE PROCESSOR LOADS CODE INSTRUCTIONS INTO SMM SPACE IN THE RAM 1605

OPENING THE ACCESS LOCKS TO THE SECURITY HARDWARE 1615

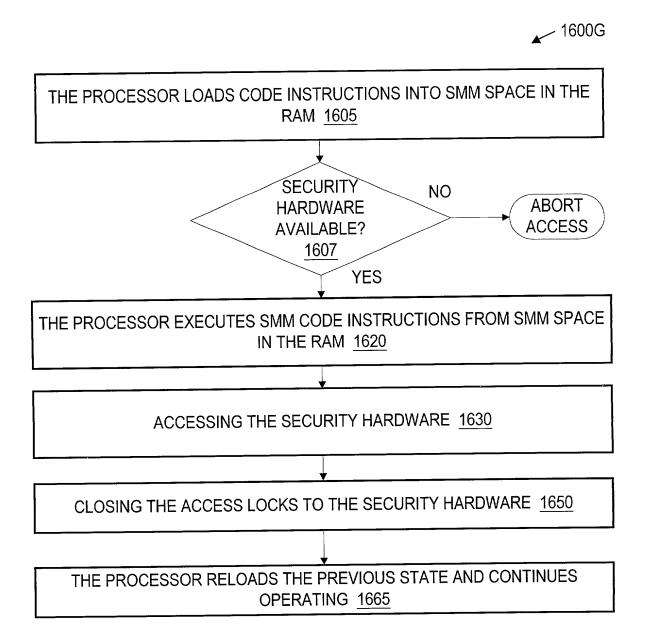
THE PROCESSOR EXECUTES SMM CODE INSTRUCTIONS FROM SMM SPACE IN THE RAM 1620

ACCESSING THE SECURITY HARDWARE 1630

CLOSING THE ACCESS LOCKS TO THE SECURITY HARDWARE 1650

THE PROCESSOR RELOADS THE PREVIOUS STATE AND CONTINUES OPERATING 1665

Fig. 16F

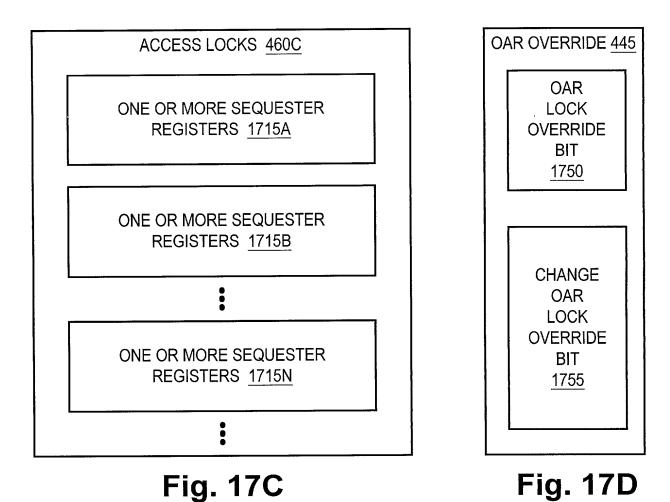


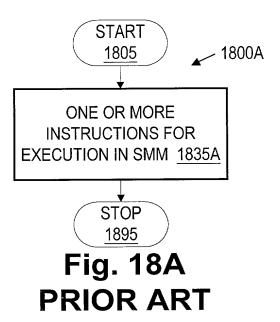
**Fig. 16G** 

35 / 73 **▲** 460B **▲** 460A SEQUESTER BIT SEQUESTER REGISTERS 1710 REGISTER 1705

Fig. 17A

Fig. 17B





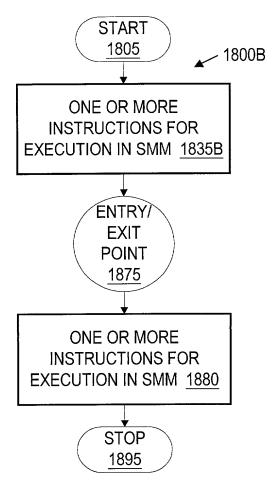
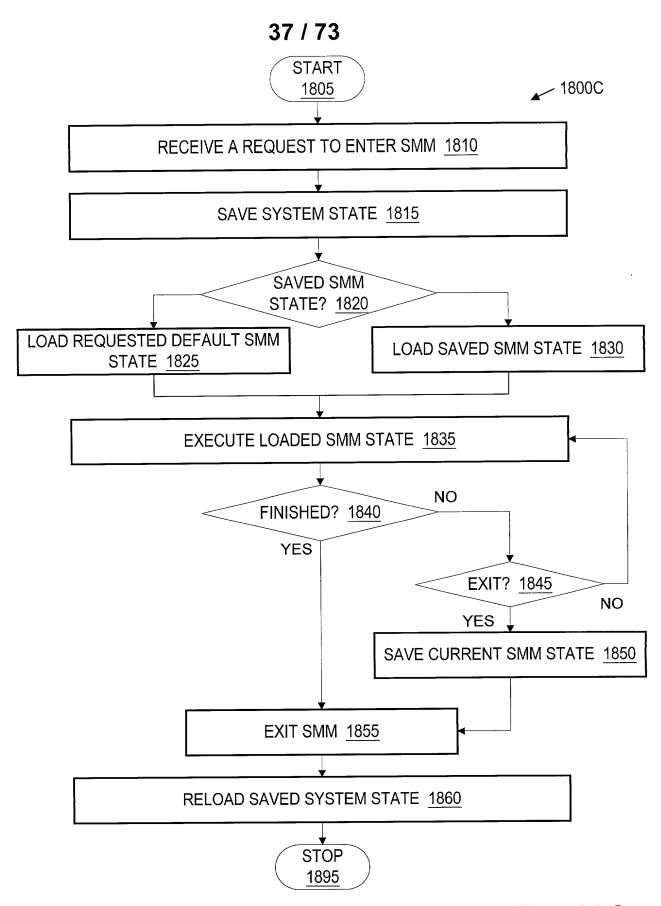


Fig. 18B



**Fig. 18C** 

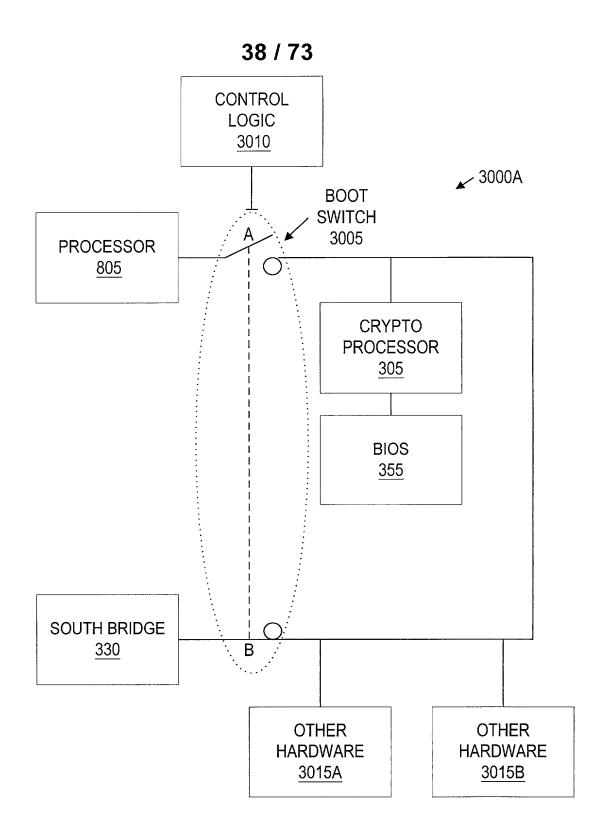
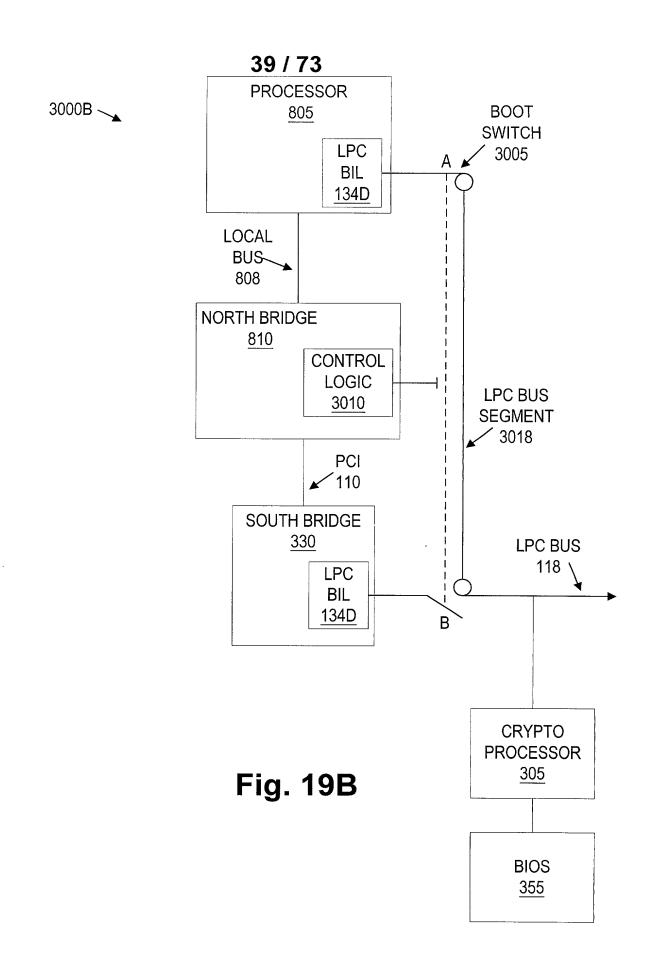


Fig. 19A



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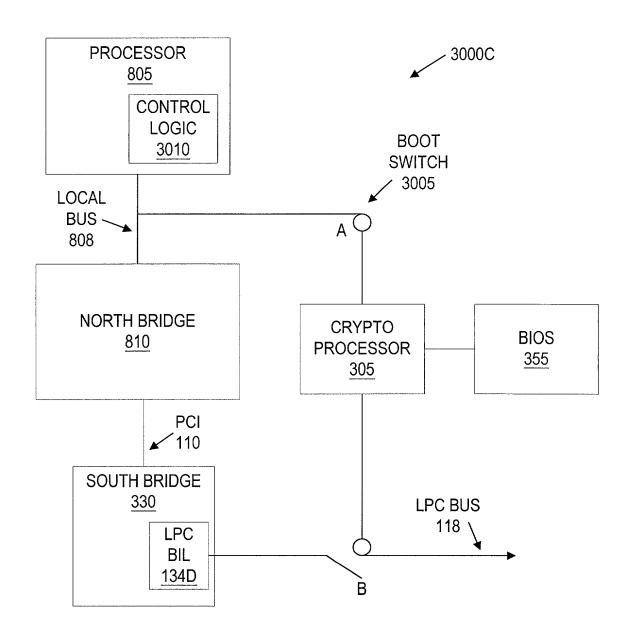


Fig. 19C

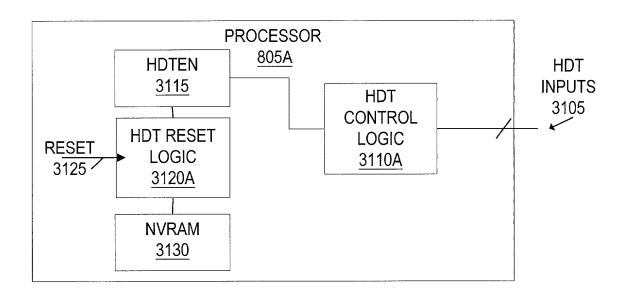
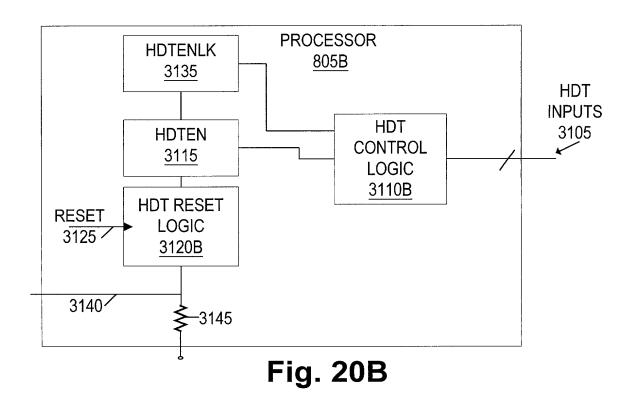
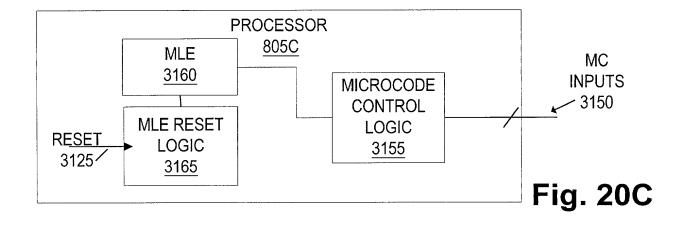
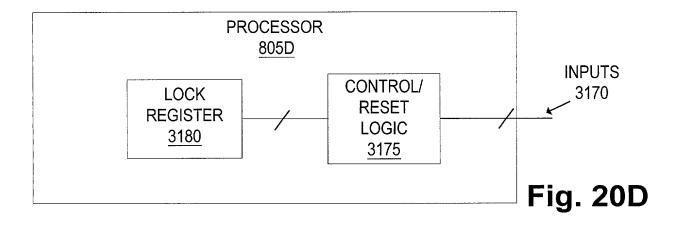


Fig. 20A



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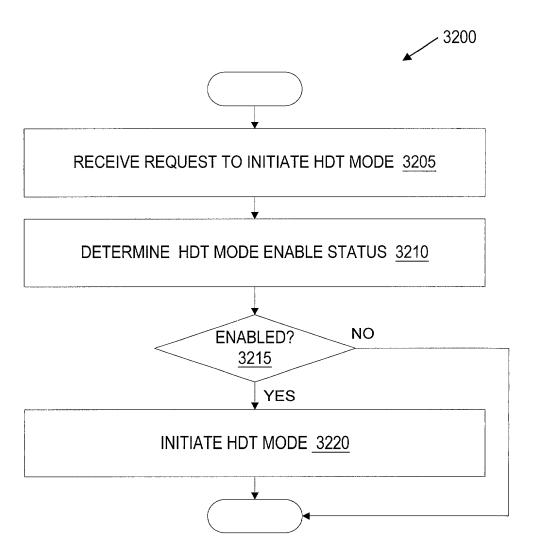


Fig. 21

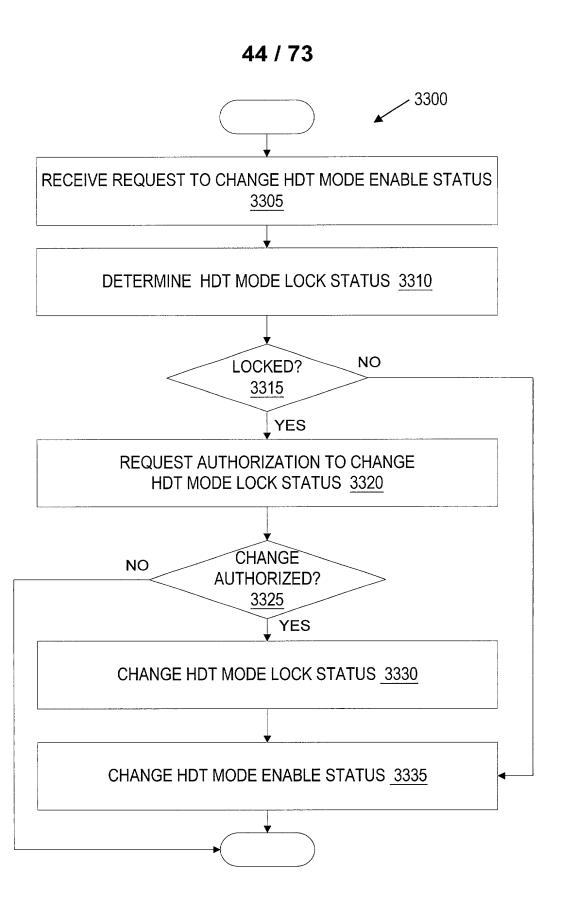


Fig. 22

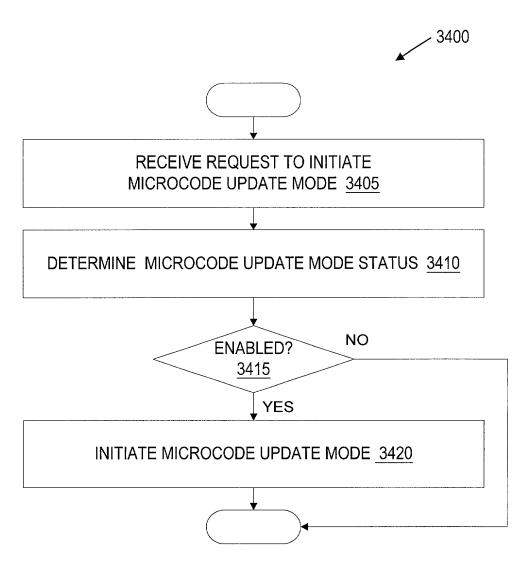


Fig. 23

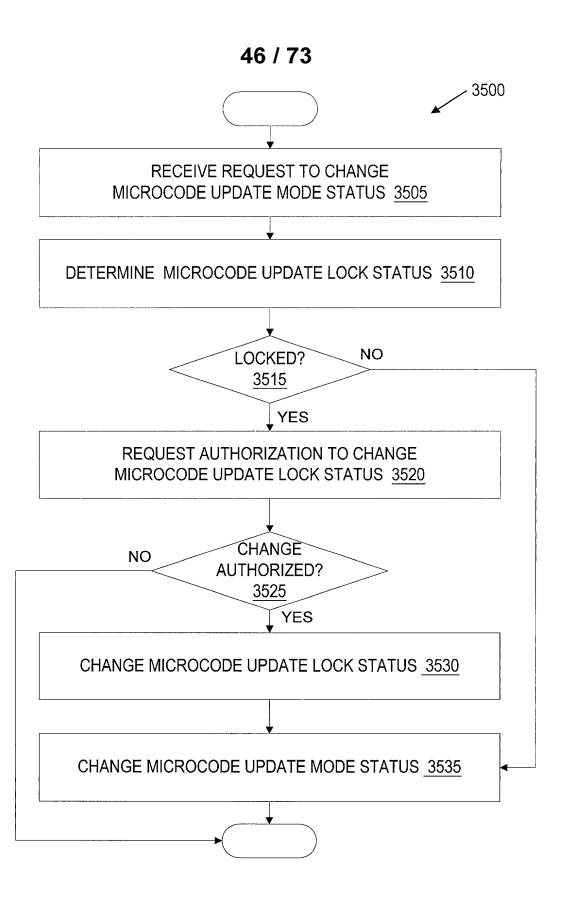
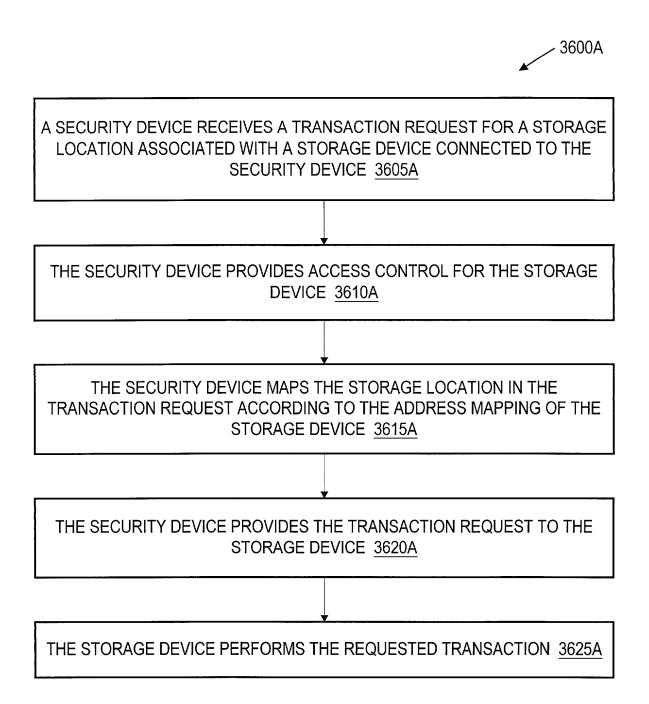
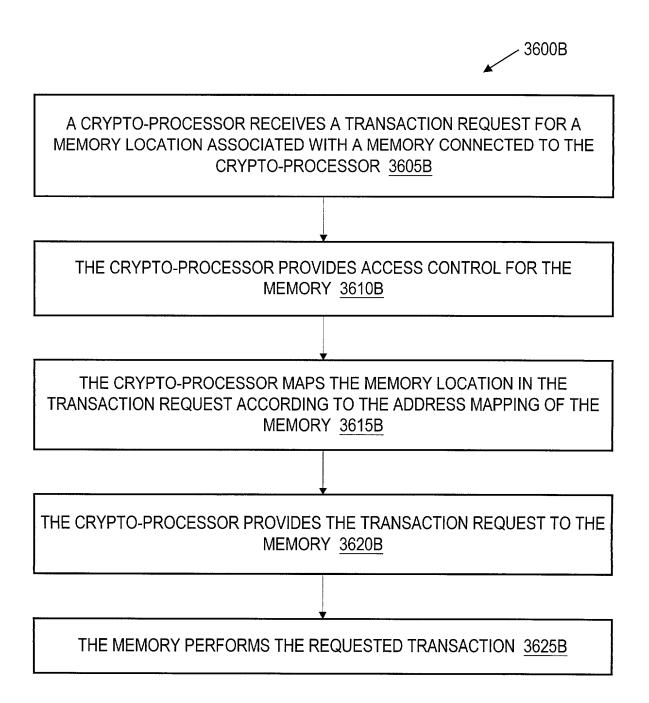


Fig. 24



**Fig. 25A** 



**Fig. 25B** 

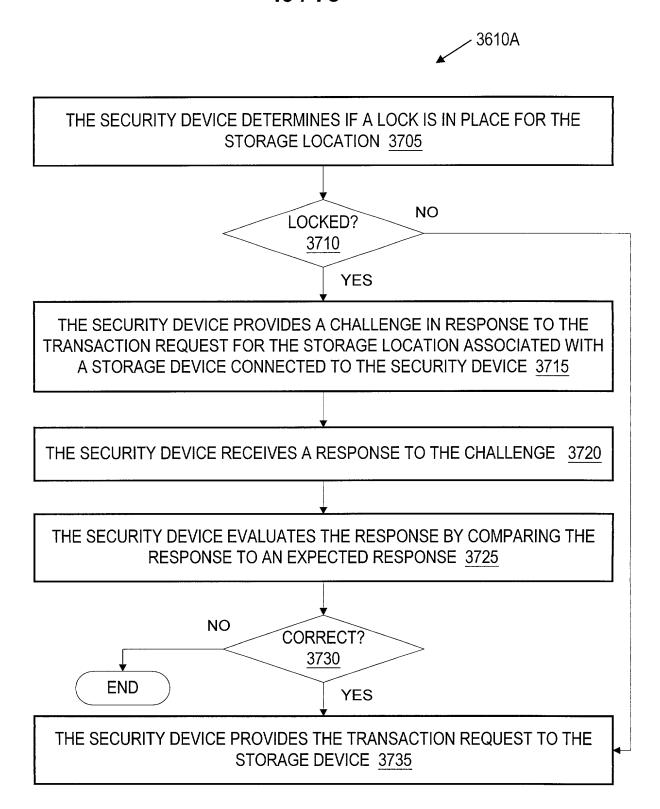


Fig. 26

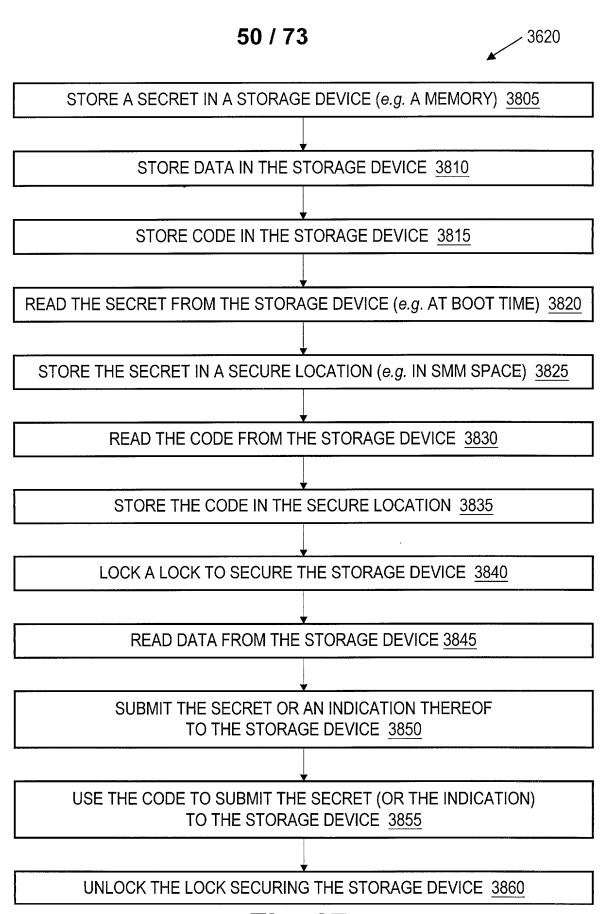


Fig. 27

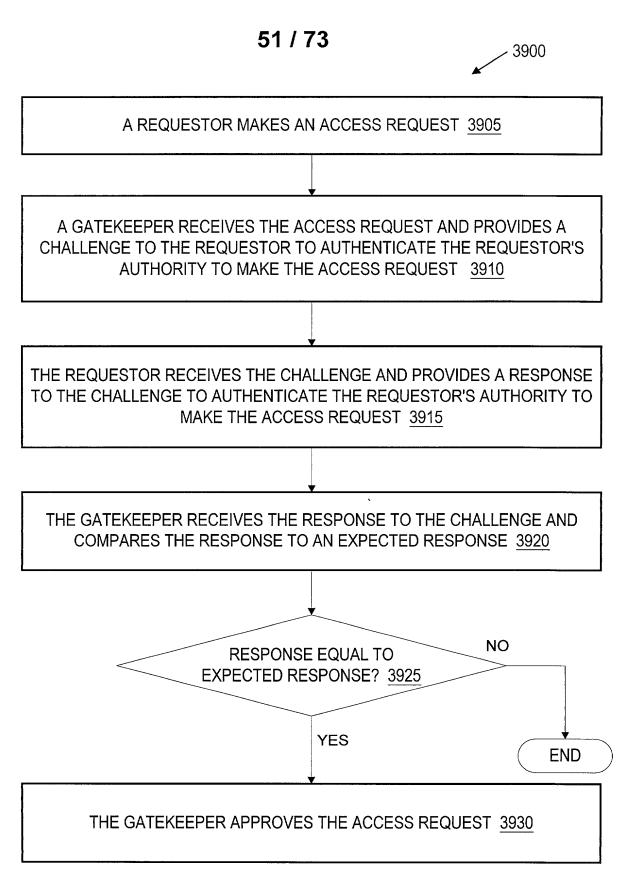
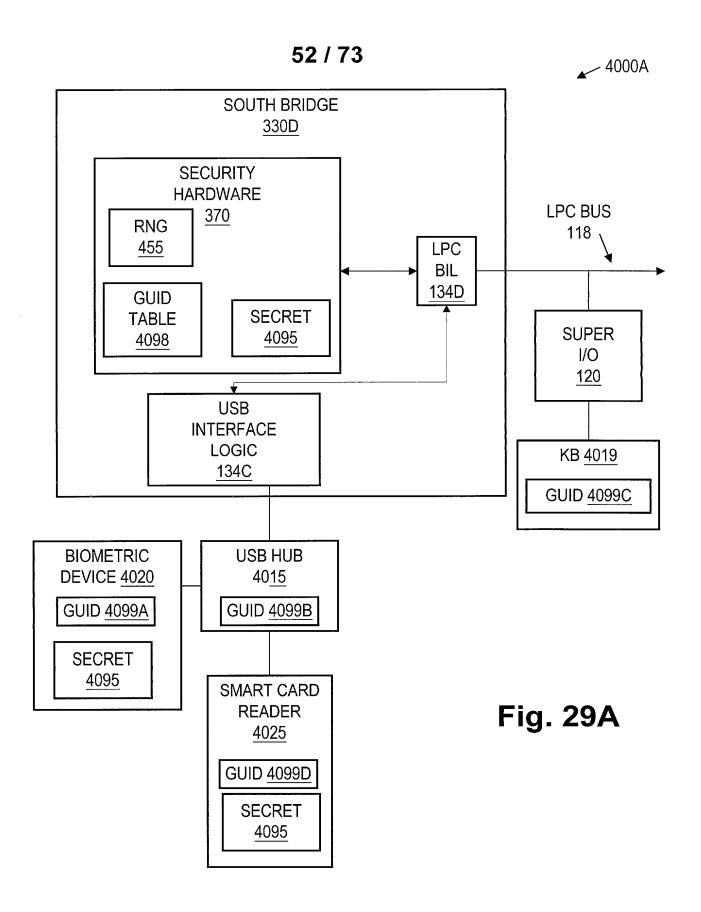


Fig. 28 (Prior Art)



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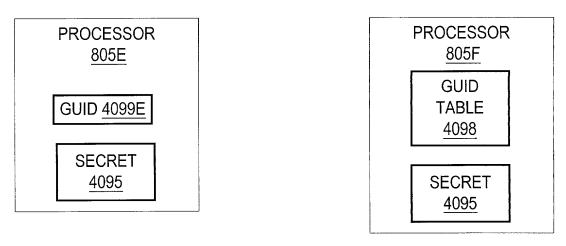
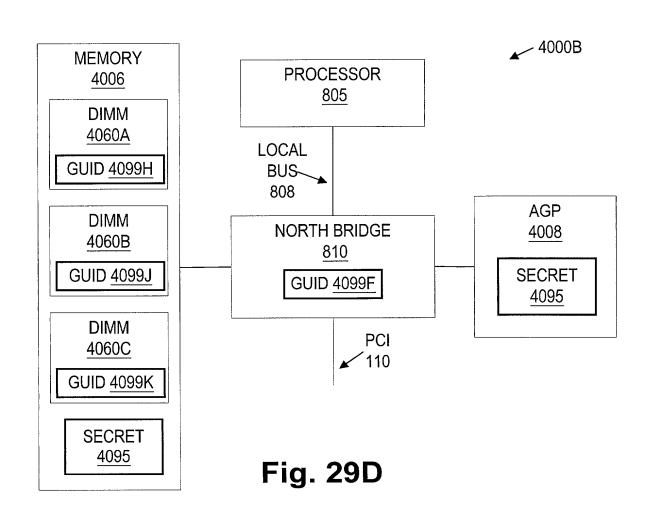
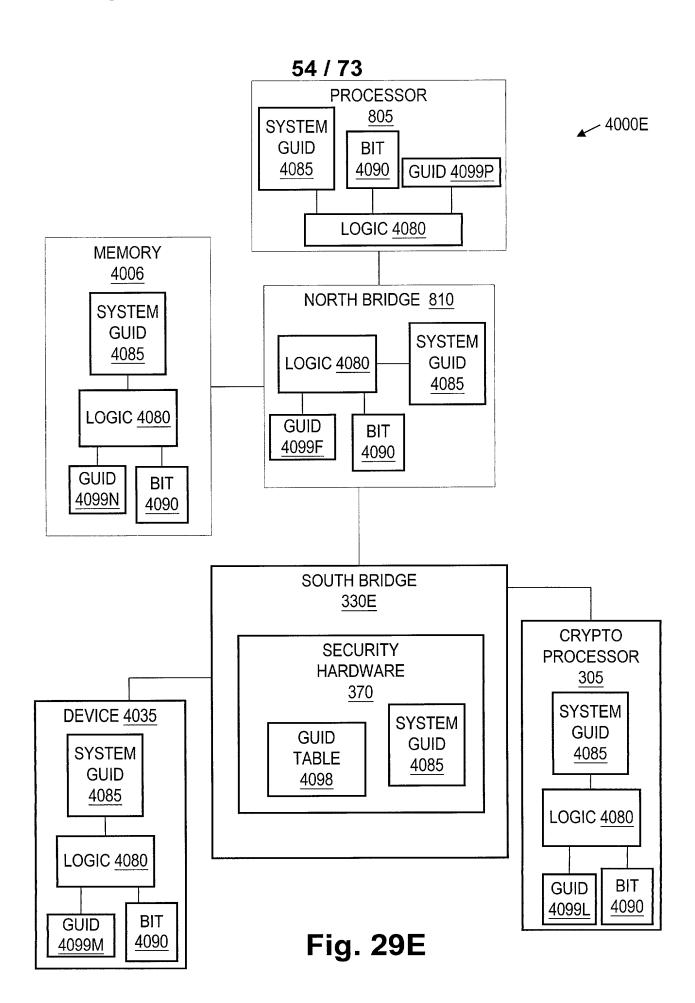


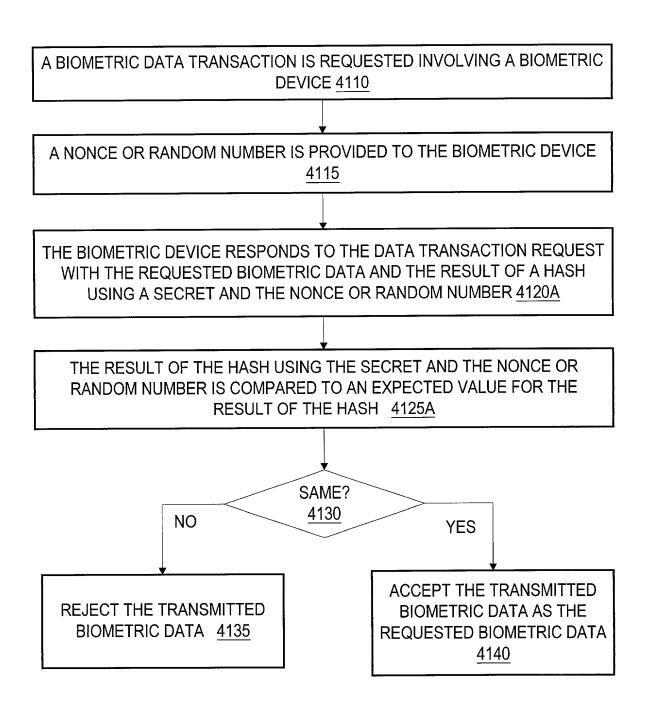
Fig. 29B

Fig. 29C





4100A



**Fig. 30A** 

4100B

A BIOMETRIC DATA TRANSACTION IS REQUESTED INVOLVING A BIOMETRIC DEVICE 4110 A NONCE OR RANDOM NUMBER IS PROVIDED TO THE BIOMETRIC DEVICE 4115 THE BIOMETRIC DEVICE RESPONDS TO THE DATA TRANSACTION REQUEST WITH THE REQUESTED BIOMETRIC DATA IN ENCRYPTED FORM AND THE RESULT OF A HASH USING A SECRET AND THE NONCE OR RANDOM NUMBER 4120B THE RESULT OF THE HASH USING THE SECRET AND THE NONCE OR RANDOM NUMBER IS COMPARED TO AN EXPECTED VALUE FOR THE RESULT OF THE HASH 4125B SAME? 4130 NO YES ACCEPT THE TRANSMITTED REJECT THE TRANSMITTED BIOMETRIC DATA AS THE BIOMETRIC DATA 4135 REQUESTED BIOMETRIC DATA

Fig. 30B

4140



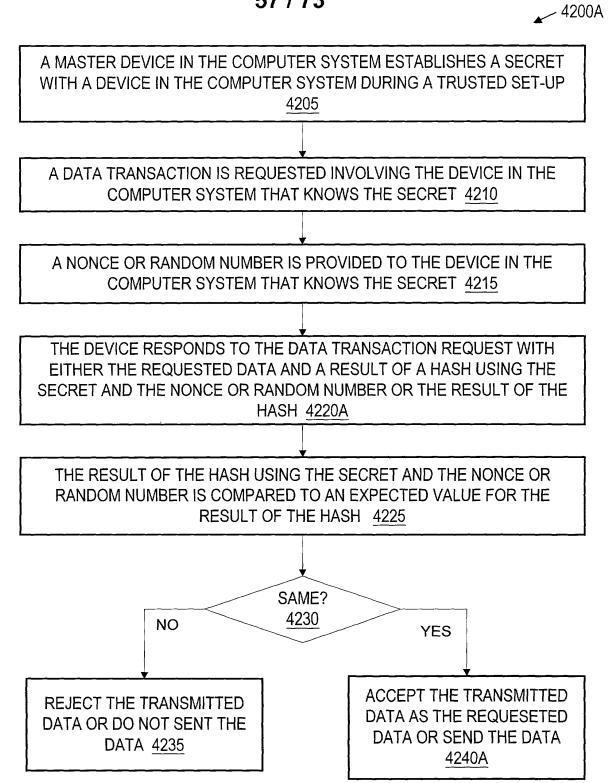
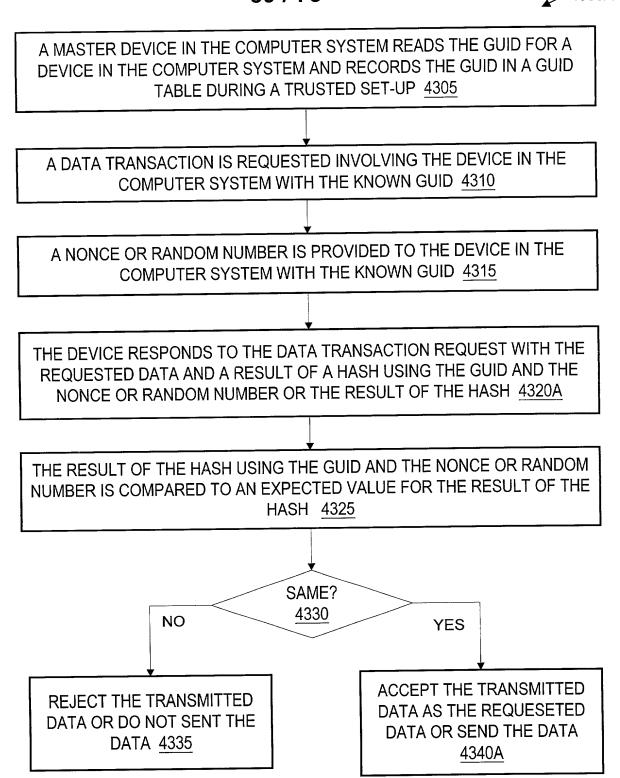


Fig. 31A

A MASTER DEVICE IN THE COMPUTER SYSTEM ESTABLISHES A SECRET WITH A DEVICE IN THE COMPUTER SYSTEM DURING A TRUSTED SET-UP 4205 A DATA TRANSACTION IS REQUESTED INVOLVING THE DEVICE IN THE COMPUTER SYSTEM THAT KNOWS THE SECRET 4210 A NONCE OR RANDOM NUMBER IS PROVIDED TO THE DEVICE IN THE COMPUTER SYSTEM THAT KNOWS THE SECRET 4215 THE DEVICE RESPONDS TO THE DATA TRANSACTION REQUEST BY EITHER ENCRYPTING THE REQUESTED DATA USING THE SECRET AND THE NONCE OR RANDOM NUMBER AND TRANSMITTING THE ENCRYPTED DATA AND A RESULT OF A HASH USING THE SECRET AND THE NONCE OR RANDOM NUMBER OR TRANSMITTING THE RESULT OF THE HASH 4220B THE RESULT OF THE HASH USING THE SECRET AND THE NONCE OR RANDOM NUMBER IS COMPARED TO AN EXPECTED VALUE FOR THE RESULT OF THE HASH 4225 SAME? 4230 NO YES ACCEPT THE TRANSMITTED REJECT THE TRANSMITTED DATA AS THE REQUESETED DATA OR DO NOT SENT THE DATA OR ENCRYPT USING THE DATA 4235 SECRET AND THE NONCE OR RANDOM NUMBER AND SEND THE ENCRYPTED DATA 4240B

**Fig. 31B** 



**Fig. 32A** 

A MASTER DEVICE IN THE COMPUTER SYSTEM READS THE GUID FOR A DEVICE IN THE COMPUTER SYSTEM AND RECORDS THE GUID IN A GUID TABLE DURING A TRUSTED SET-UP 4305

A DATA TRANSACTION IS REQUESTED INVOLVING THE DEVICE IN THE COMPUTER SYSTEM WITH THE KNOWN GUID 4310

A NONCE OR RANDOM NUMBER IS PROVIDED TO THE DEVICE IN THE COMPUTER SYSTEM WITH THE KNOWN GUID 4315

THE DEVICE RESPONDS TO THE DATA TRANSACTION REQUEST BY ENCRYPTING THE REQUESTED DATA USING THE GUID AND THE NONCE OR RANDOM NUMBER AND TRANSMITTING THE ENCRYPTED DATA AND A RESULT OF A HASH USING THE GUID AND THE NONCE OR RANDOM NUMBER OR TRANSMITTING THE RESULT OF THE HASH 4320B

THE RESULT OF THE HASH USING THE GUID AND THE NONCE OR RANDOM NUMBER IS COMPARED TO AN EXPECTED VALUE FOR THE RESULT OF THE HASH 4325

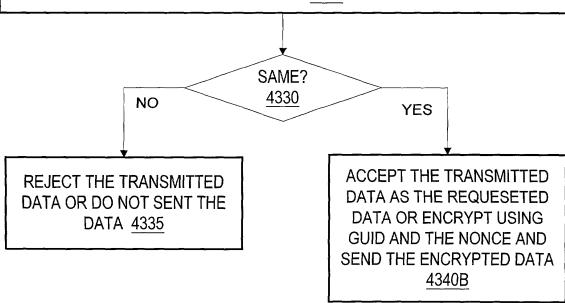


Fig. 32B

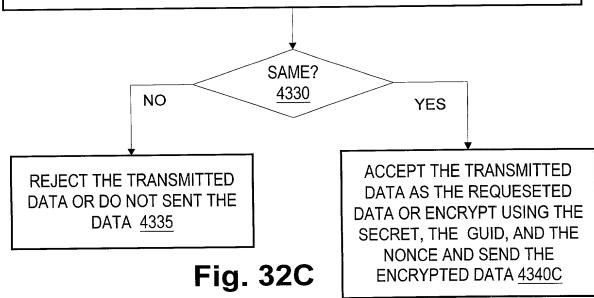
A MASTER DEVICE IN THE COMPUTER SYSTEM READS THE GUID FOR A DEVICE IN THE COMPUTER SYSTEM, RECORDS THE GUID IN A GUID TABLE, AND TRANSMITS A SECRET TO THE DEVICE DURING A TRUSTED SET-UP 4306

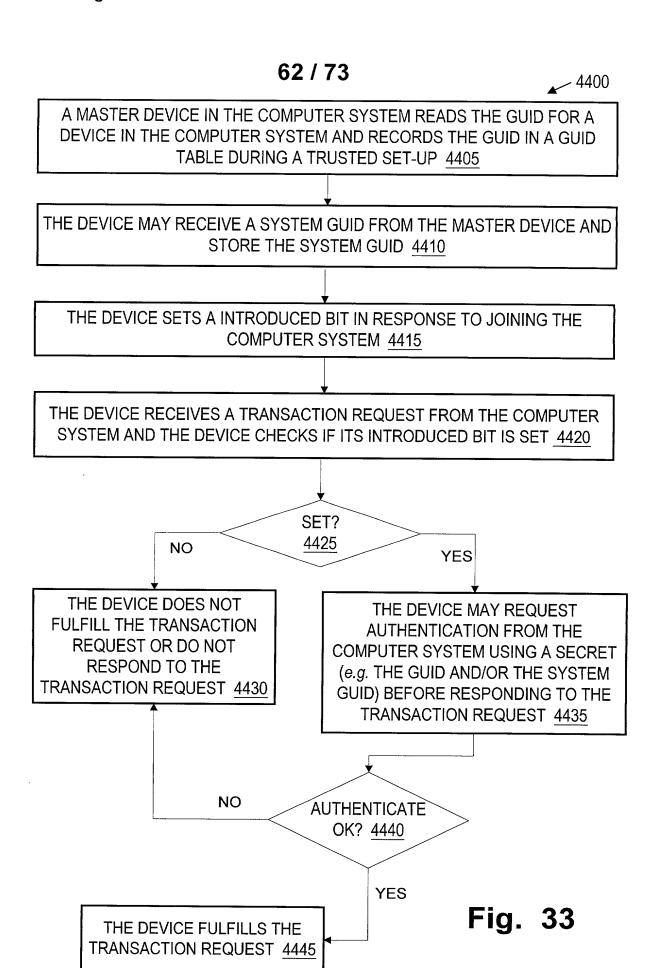
A DATA TRANSACTION IS REQUESTED INVOLVING THE DEVICE IN THE COMPUTER SYSTEM WITH THE KNOWN GUID THAT KNOWS THE SECRET 4311

A NONCE OR RANDOM NUMBER IS PROVIDED TO THE DEVICE IN THE COMPUTER SYSTEM WITH THE KNOWN GUID THAT KNOWS THE SECRET 4316

THE DEVICE RESPONDS TO THE DATA TRANSACTION REQUEST BY ENCRYPTING THE REQUESTED DATA USING THE SECRET, THE GUID, AND THE NONCE OR RANDOM NUMBER AND TRANSMITTING THE ENCRYPTED DATA AND A RESULT OF A HASH USING THE SECRET, THE GUID, AND THE NONCE OR RANDOM NUMBER OR TRANSMITTING THE RESULT OF THE HASH 4320C

THE RESULT OF THE HASH USING THE SECRET, THE GUID, AND THE NONCE OR RANDOM NUMBER IS COMPARED TO AN EXPECTED VALUE FOR THE RESULT OF THE HASH  $\frac{4326}{}$ 





4500

THE DEVICE OR THE MASTER DEVICE INITIATES A REQUEST FOR THE DEVICE TO LEAVE THE COMPUTER SYSTEM 4505

THE DEVICE AND THE MASTER DEVICE AUTHENTICATE EACH OTHER USING THE GUID AND/OR THE SYSTEM GUID IN RESPONSE TO THE REQUEST FOR THE DEVICE TO LEAVE THE COMPUTER SYSTEM 4510

THE DEVICE RESETS THE INTRODUCED BIT IN RESPONSE TO THE DEVICE AND THE MASTER DEVICE SUCCESSFULLY AUTHENTICATING EACH OTHER 4515

Fig. 34

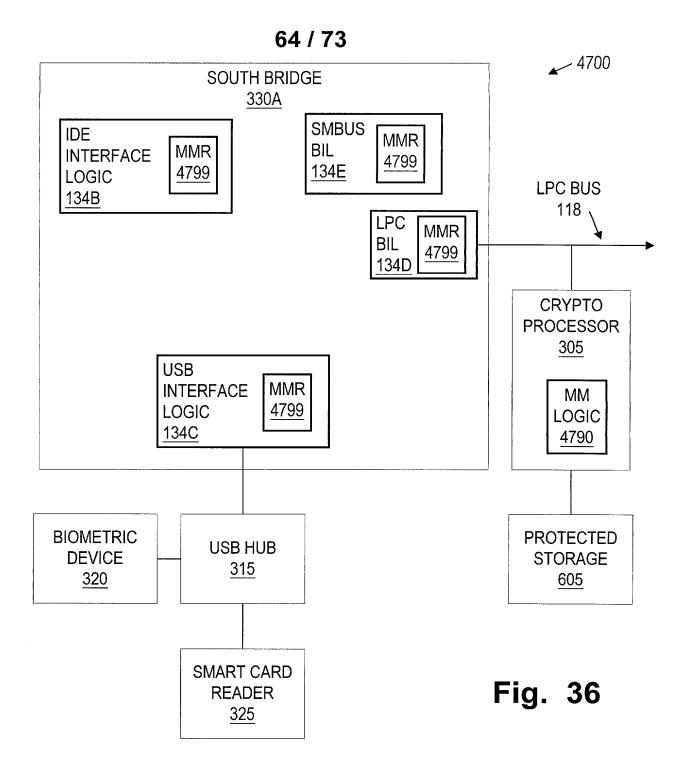
4600

THE DEVICE RECEIVING A COMMAND FOR THE DEVICE TO LEAVE THE COMPUTER SYSTEM 4605

THE DEVICE RECEIVING A MAINTENANCE KEY THAT SUCCESSFULLY AUTHENTICATES 4610

THE DEVICE RESETS THE INTRODUCED BIT IN RESPONSE TO THE DEVICE RECEIVING THE MAINTENANCE KEY THAT SUCCESSFULLY AUTHENTICATES 4615

Fig. 35



4800

TRANSMIT A MASTER MODE SIGNAL TO BUS INTERFACE LOGIC CONNECTED BETWEEN MASTER MODE LOGIC AND A DATA INPUT DEVICE, WHERE THE BUS INTERFACE LOGIC INCLUDES A MASTER MODE REGISTER  $\frac{4805}{}$ 

SET A MASTER MODE BIT IN THE MASTER MODE REGISTER(S) TO ESTABLISH SECURE TRANSMISSION CHANNEL BETWEEN THE MASTER MODE LOGIC AND THE DATA INPUT DEVICE OUTSIDE THE OPERATING SYSTEM OF THE COMPUTER SYSTEM 4810

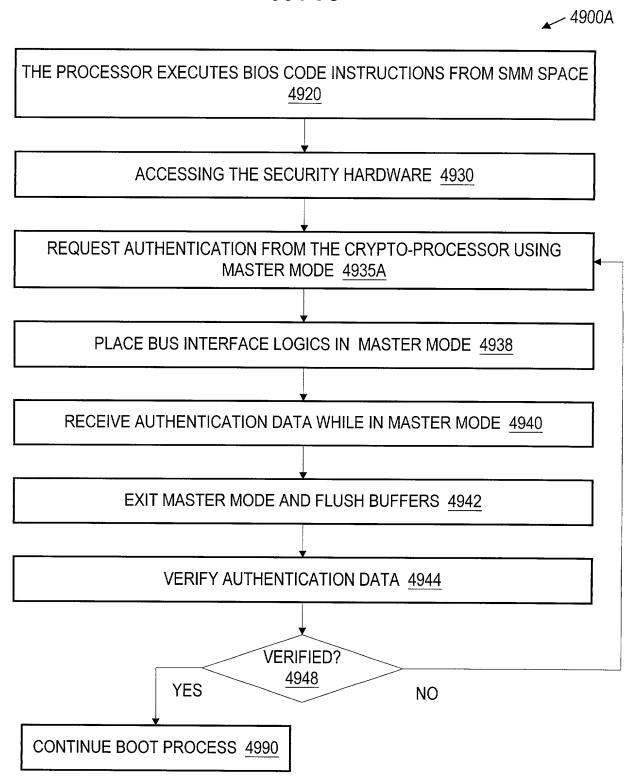
THE MASTER MODE LOGIC AND THE DATA INPUT DEVICE EXCHANGE DATA OUTSIDE THE OPERATING SYSTEM OF THE COMPUTER SYSTEM THROUGH THE BUS INTERFACE LOGIC(S) THAT INCLUDE THE MASTER MODE REGISTER 4815

THE MASTER MODE LOGIC FLUSHES THE BUFFERS OF THE BUS INTERFACE LOGIC(S) THAT INCLUDE THE MASTER MODE REGISTER AFTER CONCLUDING THE DATA TRANSMISSIONS 4820

THE MASTER MODE LOGIC SIGNALS THE BUS INTERFACE LOGIC(S) TO UNSET THE MASER MODE BITS AFTER FLUSHING THE BUFFERS OF THE BUS INTERFACE LOGIC(S) THAT INCLUDE THE MASTER MODE REGISTER 4825

Fig. 37





**Fig. 38A** 

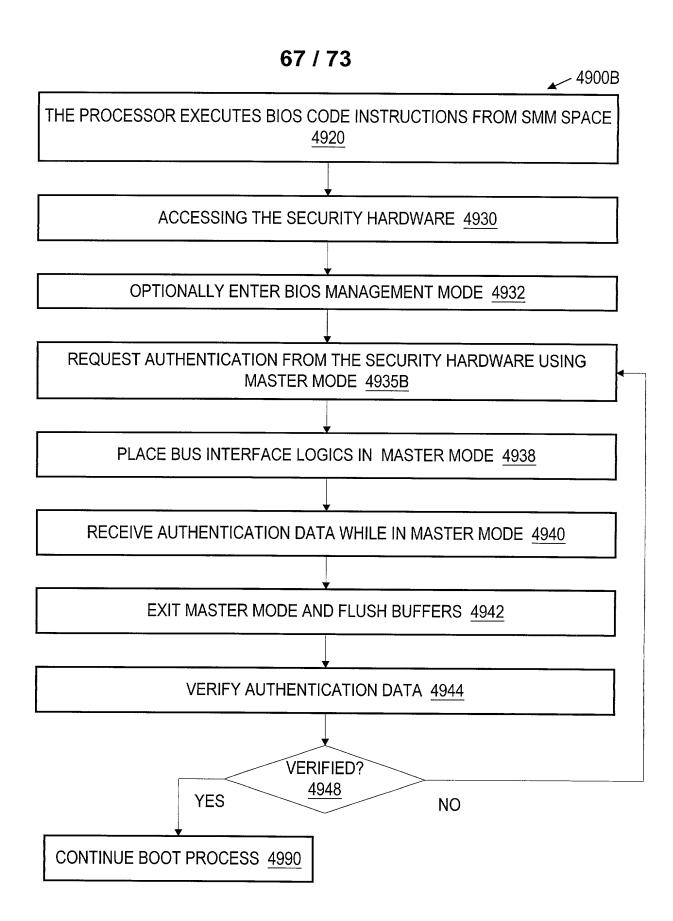


Fig. 38B

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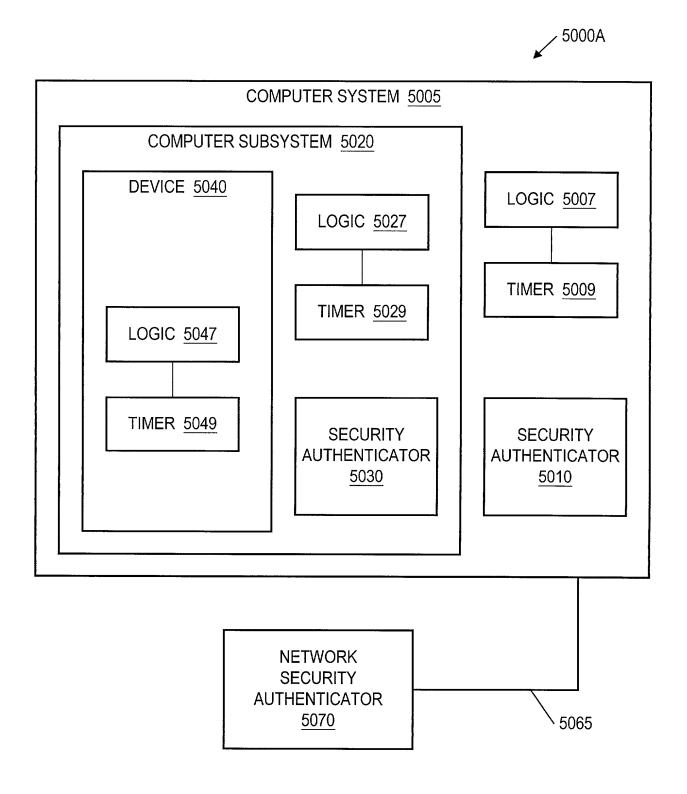
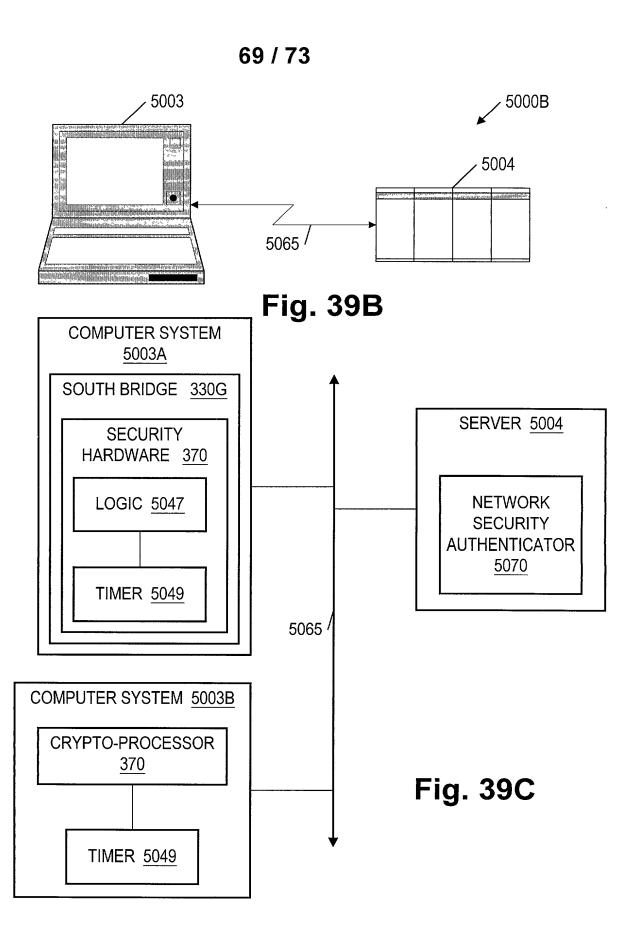
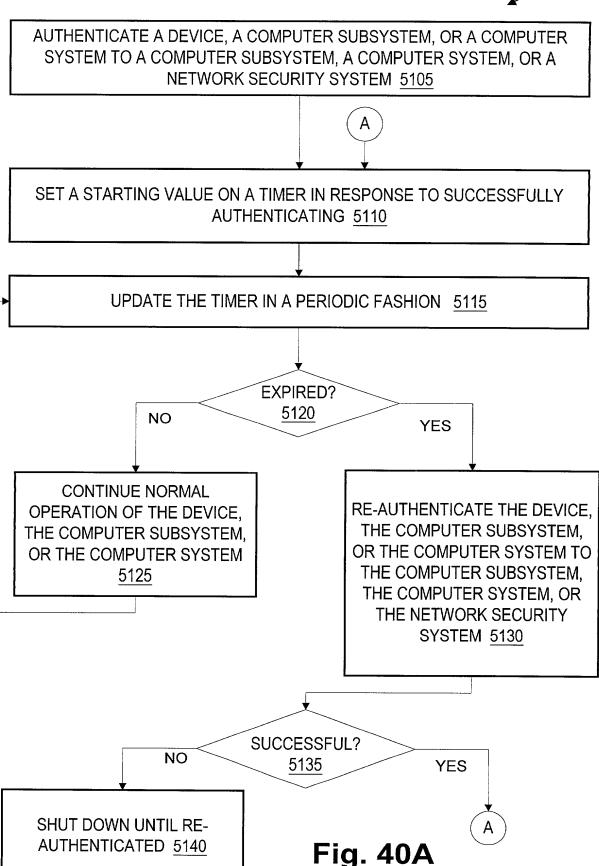


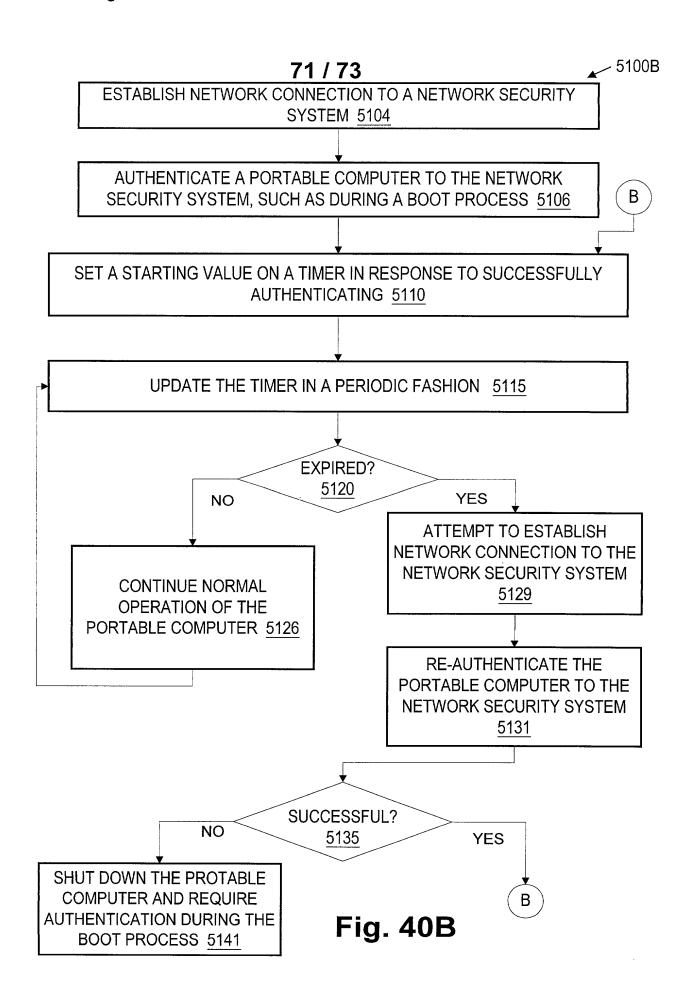
Fig. 39A





✓ 5100A





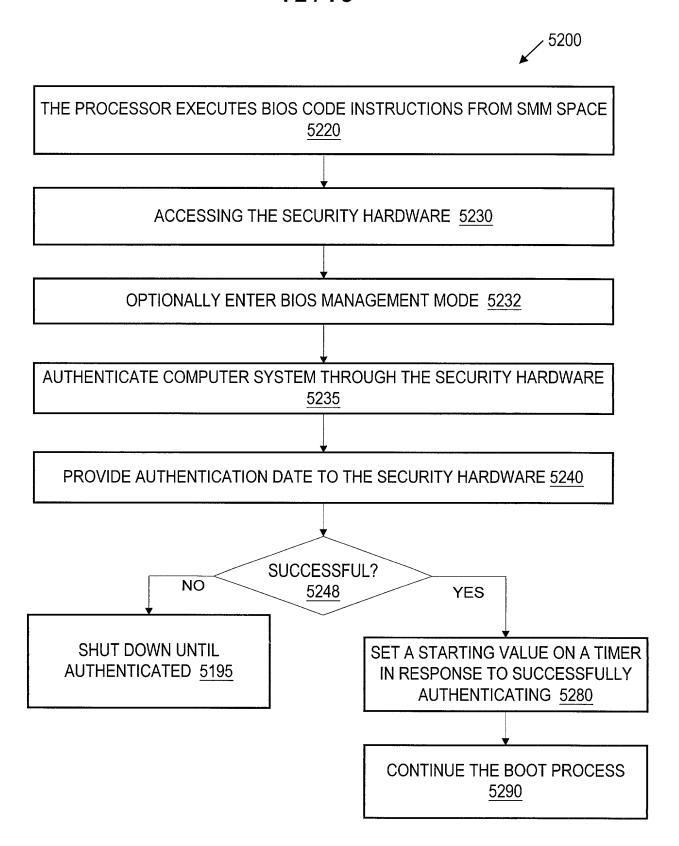


Fig. 41

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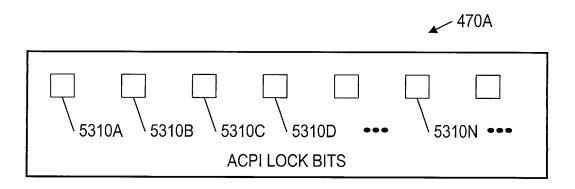


Fig. 42A

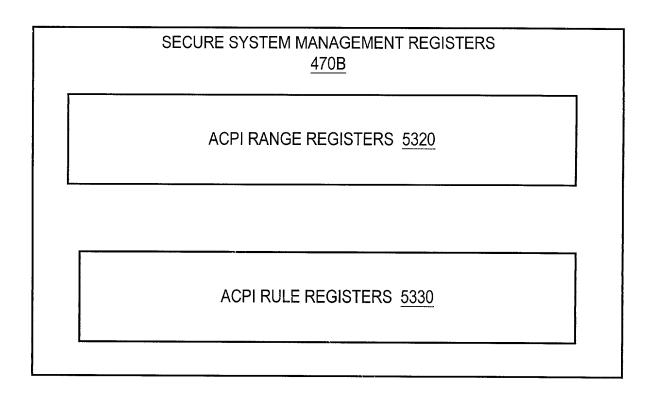


Fig. 42B